Fall 2018

CE 634-103: Structural Dynamics

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New Jersey Institute of Technology
Department of Civil and Environmental Engineering

CE 634 – Structural Dynamics

Section 103

Instructor:

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Office hours: by appointments

Textbook

Chopra, A. K., "Dynamics of Structures: Theory and Applications to Earthquake Engineering," 5th Edition, Pearson

Prerequisites:

A solid working knowledge of structural analysis including solving beams/frames, ordinary differential equations (ODE), and matrix algebra is needed.

Grading:

Homework+Project	30%
Mid-Term	30%
Final	40%

Minimum grades for letter grades are as following:

A = 92.0%, B+ = 86.0%, B = 80.0%, C+ = 74.0%, C = 68.0%, F < 68.0%

Homework:

Late homework will not be graded. Homework is to be submitted individually.

Course Objectives:

Single-degree-of-freedom system: derive, and solve equation of motion (EOM)
Numerical solution of Single-degree-of-freedom
Multiple-degree-of-free system: find mode shapes, modal frequencies for a general MDOF
Distributed-elasticity systems: derive, and solve EOM for distributed elastic system such as a beam

Academic Integrity:

New Jersey Institute of Technology's code on Academic Integrity will be upheld throughout the course. It is student's responsibility to be familiar with the code.

Course Outline: (tentative)

Week(s)	Date	Subject	Chapter(s)
1	9/5	SDOF: Introduction, Equation of Motion (EOM), Free Vibration, Rigid Body Assemblages	1, 2, 8
2	9/12	SDOF: Response to Harmonic Excitations	3
3	9/19		
4	19/26	SDOF: Response to General Excitations	4
5	10/3		
6	10/10	Numerical Integration of EOM; Application(s) for Dynamic Analysis of SDOF (such as NONLIN - http://training.fema.gov/EMIWeb/nonlin.asp)	5
7	10/17		
8	10/24	Mid-Term (tentative) – Project Definition	
9	10/31	Introduction to Earthquake Engineering: Response Spectrum Concept	6
10	11/7	MDOF: Introduction, EOM, Free Vibration, Mode Shapes, Frequencies	9-10
11	11/14	MDOF: Modal Analysis, Forced Vibration	12
12	11/28		
13	12/5	Systems with Distributed Mass and Elasticity	16
14	12/12	Approximate Methods	8, 10
15	12/19	Final	

Note: there is no meeting on Wednesday 11/21/18.